CLAIMS

1. A balloon catheter comprising a catheter shaft, a balloon attached to the catheter shaft, a first electrode and a second electrode positioned in the balloon with a clearance kept between them along the catheter shaft, high-frequency power supply leads for supplying high-frequency power to the first and second electrodes, and a liquid supply passage for supplying a liquid into the balloon, wherein the surface area SA of the first electrode and the surface area SB of the second electrode are 20 mm^2 or more respectively.

2. A balloon catheter, according to claim 1, wherein the shortest distance Esd between the first electrode and the second electrode is 1 mm or more.

3. A balloon catheter, according to claim 1, wherein a spacer for keeping the clearance between the first electrode and the second electrode is disposed between these electrodes.

4. A balloon catheter, according to claim 1, which further comprises a temperature sensor disposed inside or on the outer surface of the balloon, and temperature information deriving leads for deriving the temperature information detected by the temperature sensor.

5. A balloon catheter comprising a catheter shaft, a balloon attached to the catheter shaft, a first electrode and a second electrode positioned in the balloon with a clearance kept between them along the catheter shaft, high-frequency power supply leads

for supplying high-frequency power to the first and second electrodes, and a liquid supply passage for supplying a liquid into the balloon, wherein potential detecting electrodes for detecting the potentials of the therapeutic site are disposed on the catheter shaft outside the balloon on the front end side or rear end side of the catheter shaft, and potential information deriving leads for deriving the potential information detected by the potential detecting electrodes are provided.

6. A balloon catheter, according to claim 5, wherein the surface area SA of the first electrode and the surface area SB of the second electrode are 20 mm^2 or more respectively.

7. A balloon catheter, according to claim 5, wherein the shortest distance Esd between the first electrode and the second electrode is 1 mm or more.

8. A balloon catheter, according to claim 5, wherein a spacer for keeping the clearance between the first electrode and the second electrode is disposed between these electrodes.

9. A balloon catheter, according to claim 5, which further comprises a temperature sensor disposed inside or on the outer surface of the balloon, and temperature information deriving leads for deriving the temperature information detected by the temperature sensor.

10. A balloon catheter, according to claim 1, wherein the catheter shaft comprises an outer cylindrical shaft and an inner cylindrical shaft provided in the outer cylindrical shaft movably along the outer cylindrical shaft; the front end of the balloon

is fixed to the front end of the inner cylindrical shaft while the rear end of the balloon is fixed to the front end of the outer cylindrical shaft, so that when the inner cylindrical shaft is moved relatively to the outer cylindrical shaft, the balloon can be deformed; and the first and second electrodes are positioned with a clearance kept between them along the inner cylindrical shaft.

11. A balloon catheter, according to claim 10, wherein the liquid supply passage is formed as the clearance between the outer cylindrical shaft and the inner cylindrical shaft.

12. A balloon catheter, according to claim 5, wherein the catheter shaft comprises an outer cylindrical shaft and an inner cylindrical shaft provided in the outer cylindrical shaft movably along the outer cylindrical shaft; the front end of the balloon is fixed to the front end of the inner cylindrical shaft while the rear end of the balloon is fixed to the front end of the outer cylindrical shaft, so that when the inner cylindrical shaft is moved relatively to the outer cylindrical shaft, the balloon can be deformed; the first and second electrodes are positioned with a clearance kept between them along the inner cylindrical shaft; in the case where the potential detecting electrodes are positioned outside the balloon on the front end side of the catheter shaft, the potential detecting electrodes are disposed on the inner cylindrical shaft; and in the case where the potential detecting electrodes are positioned outside the balloon on the rear end side of the catheter shaft, the potential detecting

electrodes are disposed on the outer cylindrical shaft.

13. A balloon catheter, according to claim 12, wherein the liquid supply passage is formed as the clearance between the outer cylindrical shaft and the inner cylindrical shaft.

14. A balloon catheter, according to claim 4, wherein a temperature information processor connected with the temperature information deriving leads and a high-frequency power adjusting device connected with the high-frequency power supply leads are provided to ensure that the high-frequency power supplied to the first and second electrodes can be adjusted by the high-frequency power adjusting device in response to the temperature judged by the temperature information processor.

15. A balloon catheter, according to claim 9, wherein a temperature information processor connected with the temperature information deriving leads and a high-frequency power adjusting device connected with the high-frequency power supply leads are provided to ensure that the high-frequency power supplied to the first and second electrodes can be adjusted by the high-frequency power adjusting device in response to the temperature judged by the temperature information processor.

16. A balloon catheter, according to claim 1, wherein the frequency of the high-frequency power supplied to the first and second electrodes is 100 KHz to 2.45 GHz; and the high-frequency power heats the liquid supplied from the liquid supply passage into the balloon for filling the balloon, to a temperature of 50°C to 80°C.

17. A balloon catheter, according to claim 5, wherein the frequency of the high-frequency power supplied to the first and second electrodes is 100 KHz to 2.45 GHz; and the high-frequency power heats the liquid supplied from the liquid supply passage into the balloon for filling the balloon, to a temperature of 50°C to 80°C.

18. A balloon catheter, according to claim 1, wherein a liquid agitator connected with the liquid supply passage is provided to ensure that the liquid supplied from the liquid supply passage into the balloon for filling the balloon can be reciprocated between the liquid supply passage and the inside of the balloon, so that the liquid can be agitated in the balloon.

19. A balloon catheter, according to claim 5, wherein a liquid agitator connected with the liquid supply passage is provided to ensure that the liquid supplied from the liquid supply passage into the balloon for filling the balloon can be reciprocated between the liquid supply passage and the inside of the balloon, so that the liquid can be agitated in the balloon.